

# Dialogical Fingerprinting

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# Linguistic fingerprints



There are innumerable choices in language generation

Authors and speakers demonstrate regularities in the choices they make

The combinations of these regularities are as unique to an individual as a fingerprint

# Author attribution



Techniques such as stylometrics are tried-and-tested means of identifying the authors of texts

Deep learning models have been demonstrated to outperform such simplistic approaches

More recent transformer models might be expected to do even better

# Interaction



Discourse is often interactional. Social media, private chat, and face-to-face communication all follow rules of dialogue

It turns out that the ways in which a person engages in dialogue is also unique to that individual

This is the idea that underpins **dialogical fingerprinting**

# DIALOGICAL FINGERPRINTING

How people engage with dialogue is as unique to them as their fingerprint. We show that this idea can be operationalised using state-of-the-art deep learning models. Who is speaking can be determined by how they interact. Select a machine learning algorithm, select the features to use, and select the data on which to test. Then lock and learn. Deep learning algorithms construct the model which is then applied to test data: an episode of BBC Radio 4's Moral Maze. As playback continues, the model makes increasingly confident predictions about who's who.

MODEL	EPISODE	FEATURES
Support Vector Machine	D-Day	Turn ordering N-grams Turn length

CHANGE

TITLE:  
Moral Maze - D-Day 75th Anniversary

FIRST BROADCAST:  
05.05.19

TURN:  
98/128

MODEL PREDICTION

SPEAKER NAME:  
Matthew Taylor

ROLE:  
PANELLIST

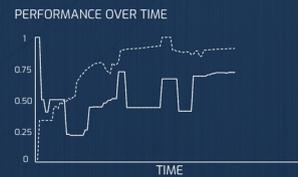
TURN EMOTIONALITY:  
● ○ ○ ○ ○



CURRENT PERFORMANCE (macro F1)

0.719 SPEAKER

0.91 ROLE

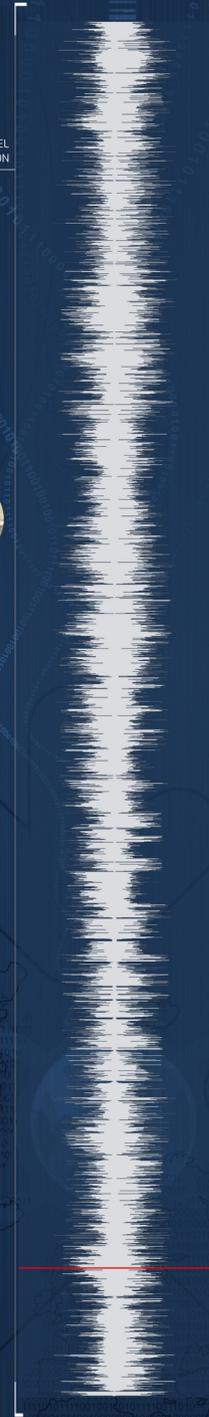


IDEOLOGICAL SCALING



MODEL PREDICTION SUMMARY

- SPEAKER 1 is: Michael Buerk
- SPEAKER 2 is: Matthew Taylor
- SPEAKER 3 is: Giles Fraser
- SPEAKER 4 is: Anne McElvoy
- SPEAKER 5 is: Mark Bhagwandin
- SPEAKER 6 is: Karl Sharro
- SPEAKER 7 is: Hew Strachan



38:44

# Dialogical Fingerprinting for the IC

Dialogical fingerprinting offers a new way to identify the sources of communication and could be put to work to help determine

- if tweets are originating from state actors
- which roles participants have in group chats
- whether different online comments are coming from a single source

# Dialogical fingerprinting in practice



Demonstrator built under the UK Dstl Defence and Security Accelerator programme



Defence and Security Accelerator

Foulis, M., Visser, J. & Reed, C. (2020) "Dialogical Fingerprinting of Debaters" in Prakken, H., Bistarelli, S., Santini, F. & Taticchi, C. (eds) Proceedings of COMMA 2020, IOS Press, pp465-466.

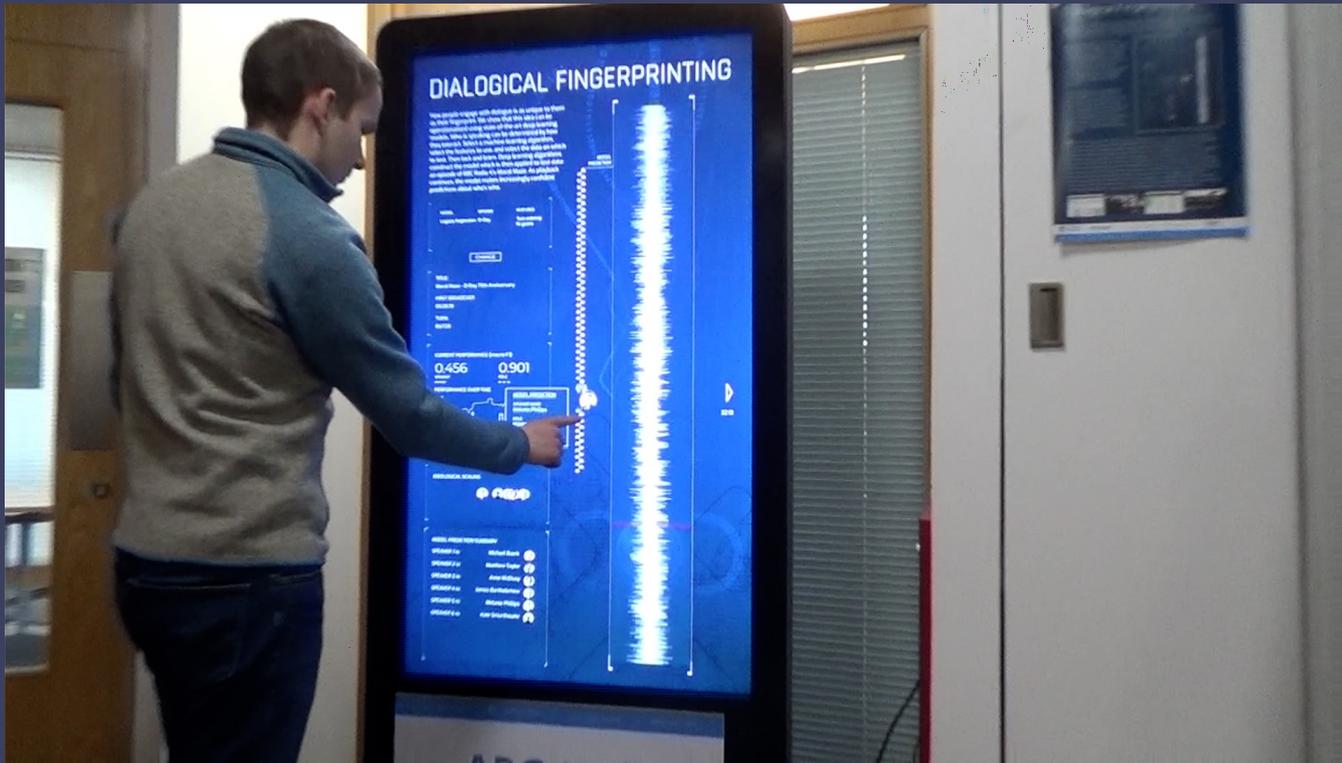
Foulis, M., Visser, J. & Reed, C. (2020) "Interactive Visualisation of Debater Identification and Characteristics" in Sperrle, F. et al. (eds) Proceedings of the ArgVis workshop on Argument Visualisation.

The screenshot shows the AIFdb Corpora website with a search bar and several dataset listings. Each listing includes a title, a brief description, download links for tar.gz and zip files, and the number of argument maps.

Dataset Name	Description	Download Links	Argument Maps
Argumentation schemes	Arguments from the Moral Maze and their argumentation schemes	<a href="#">tar.gz</a>   <a href="#">zip</a>	65
Extraits d'entretiens parus sur le site de Rue89	Analyses d'arguments en Français lors d'entretiens de type question/réponse	<a href="#">tar.gz</a>   <a href="#">zip</a>	3
हिन्दी संग्रह	इसमें बीबीसी से लिए दो समाचारों का ओवा विश्लेषण है।	<a href="#">tar.gz</a>   <a href="#">zip</a>	5
Негативна селекція	Григорій Каєтан, 5 червня 2014, Джерело: <a href="http://zaxid.net/news/showNews.do?negativna_seleksiya&amp;objectId=1310688">http://zaxid.net/news/showNews.do?negativna_seleksiya&amp;objectId=1310688</a>	<a href="#">tar.gz</a>   <a href="#">zip</a>	14
ECC - The Coca Cola Company			

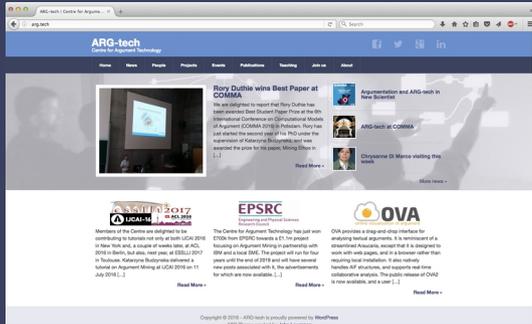
The Centre for Argument Technology has the world's largest datasets of analysed argumentation and debate against which to test algorithms for dialogical fingerprinting

# Find out more



A video on our youtube channel discusses the dialogical fingerprinting demonstrator in more detail:  
[www.youtube.com/c/Arg-techOrg](http://www.youtube.com/c/Arg-techOrg)

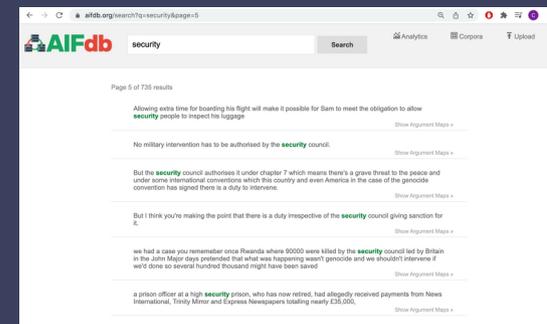
# Concluding Remarks



Find out more at  
[www.arg.tech](http://www.arg.tech)



Stephen Fry explains  
argument technology  
[arg.tech/fry](http://arg.tech/fry)



Explore our datasets  
at [aifdb.org](http://aifdb.org)

[chris@arg.tech](mailto:chris@arg.tech)



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